### BOARD OF COUNTY COMMISSIONERS AGENDA ITEM SUMMARY

Meeting Date: June 21, 2006	Division: County Attorney
Bulk Item: Yes No XX	Staff Contact Person: Pedro Mercado
	of Key West is charging the Key West International Airport the Commission wants the County Attorney to proceed.
engineering studies showing the fee the Ci met with City representatives on severa appropriate charge. Pursuant to the Coun	water utility ordinance in 2002. KWIA commissioned two ity was charging the County was excessive. The County has all occasions to try to resolve the disagreement over the try's most recent attempt to resolve the dispute, the County y. The study has been completed and again shows the fees
PREVIOUS RELEVANT BOCC ACTIONONE.	ON:
CONTRACT/AGREEMENT CHANGE N/A	S:
STAFF RECOMMENDATIONS: N/A	
TOTAL COST: N/A	BUDGETED: Yes No
COST TO COUNTY: N/A	SOURCE OF FUNDS:
REVENUE PRODUCING: Yes XX N	o AMOUNT PER MONTH
APPROVED BY: County Atty X	OMB/Purchasing Risk Management
DIVISION DIRECTOR APPROVAL:	SUZANNE A. HUYTON, COUNTY ATTORNEY
<b>DOCUMENTATION:</b> IncludedX	XX Not Required
DISPOSITION:	AGENDA ITEM #

Revised 2/05

# Florida Keys Marathon Airport Monroe County, Florida



### **USER FEE ESTIMATION**

For
Automobile Parking Lots
Resurfacing Taxiways and Apron
Resurfacing Runway
Hangar Development, Taxilanes and Apron
Basin A, D, F and outside of 27 End

PREPARED BY URS CORPORATION 7650 CORPORATE CENTER DRIVE SUITE 400 MIAMI, FL 33126 CA. # EB00000002

May 25, 2006

# **TABLE OF CONTENTS**

	PAGE
Description	1
User Fee Estimation Summary Table	2
Basin Configuration Layout - Figure "1"	3
Exhibit "A"	4

### **DESCRIPTION**

The drainage reports for the following projects in the Key West International Airport have been analyzed to estimate the user fee cost per month. The projects, report dates and drainage basin areas evaluated are:

<u>Projects</u>	<u>Date</u>	<u>Basins</u>
Automobile Parking Lots	June 1998	A7 (a, b, c, d, e)
Resurfacing Taxiways and Apron	February 2000	A1, A2, A3, A4, E1, E2
Resurfacing Runway	January 2003	A5, A6, E3
Hangar Development, Taxilanes and Apron	December 2003	B1, Parking Lot
New Terminal Building and Renovation	February 2006	A, D, F, Outside 27 End

The user fee estimation uses the information provided in these reports for the evaluation and determination of the impervious area with treatment and the impervious area without treatment. The summary table includes the 17% reduction determined in the Analysis of the Storage Volume and the 100 Year Runoff Volume Report. (See Figure 1 for Basin configuration)

On Exhibit "A" URS has included the analysis of the storage volume and the 100 year runoff volume



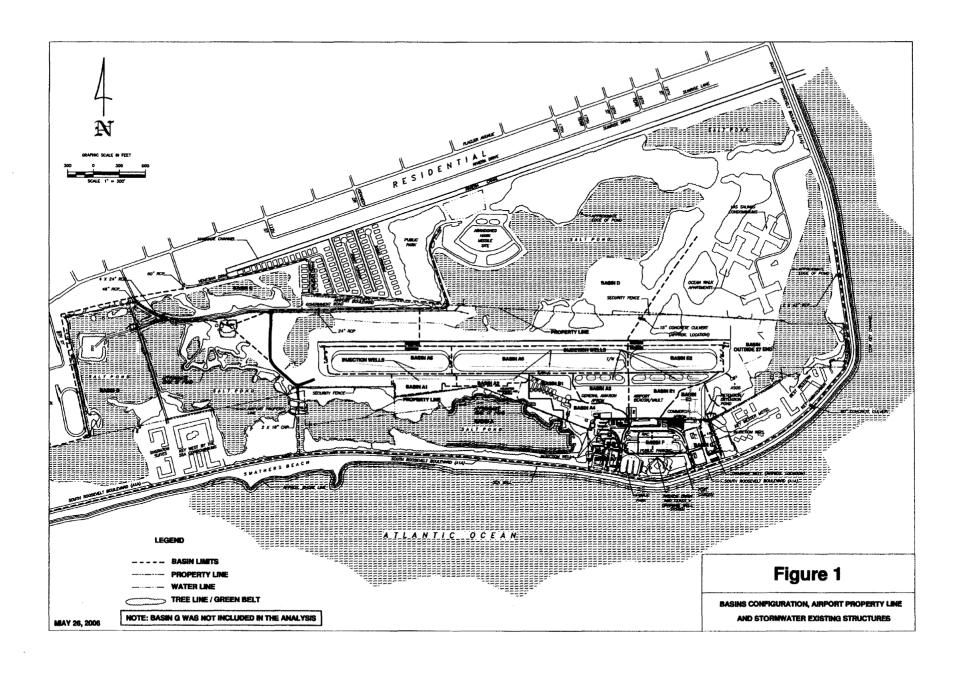
Made try:	Dete:
Checked by:	Time:
Page:	or

### KEY WEST INTERNATIONAL AIRPORT STORMWATER MANAGEMENT

### USER FEE ESTIMATION

Project	Basins	Impervious Area (with treatment)	Impervious Area (w/ treatment) (17% reduction)	Impervious Area (without treatment) *	Total Area considered for stormwater user fee	User Fee
		(Ac.)	(Ac.)	(Ac.)	(Ac.)	(\$/Month)
AUTOMOBILE PARKING LOTS	A7 (a,b,c,d,e)	1.19	0.98	0.00	0.98	122.24
RESURFACING TAXIWAYS AND APRON	A1,A2,A3,A4,E1,E2	21.84	18.04	0.00	18.04	2,245.39
RESURFACING RUNWAY	A5,A6,E3	22.59	18.66	1.58	20.24	2,519.14
HANGAR DEVELOPMENT TAXILANES AND APRONS	B1 AND PARKING LOT	3.50	2.89	0.00	2.89	359.84
EXISTING PORTION OF RUNWAY	Α	0.00	0.00	2.11	2.11	262.60
EXISTING PORTION OF RUNWAY	D	0.00	0.00	2.80	2.80	348.48
EXISTING PORTION OF RUNWAY	F	6.90	5.70	0.00	5.70	709.40
EXISTING PORTION OF RUNWAY	Outside 27 End	0.00	0.00	2.11	2.11	262.60
TOTAL	<del> </del>	56.02	47.62	8.60	56.22	6,996.50

<sup>\*</sup> Estimated.



# EXHIBIT "A" Florida Keys Marathon Airport Monroe County, Florida



# ANALYSIS OF THE STORAGE VOLUME AND THE 100 YEAR RUNOFF VOLUME

For
Automobile Parking Lots
Resurfacing Taxiways and Apron
Resurfacing Runway
Hangar Development, Taxilanes and Apron

PREPARED BY URS CORPORATION 7650 CORPORATE CENTER DRIVE SUITE 400 MIAMI, FL 33126 CA. # EB00000002

May 5, 2006

GERSON PEREIRA P.E. # 61802

# TABLE OF CONTENTS

	PAGE
Description	1
Analysis of Automobile Parking Lots	2
Analysis of Resurfacing Taxiways and Apron	3
Analysis of Resurfacing Runway	4
Analysis of Hangar Development, Taxilanes and Apron	5
Total Summary Table	6
Figure	7

Attachment A

Attachment B

Attachment C
Attachment D

### **DESCRIPTION**

The drainage reports for the following projects in the Key West International Airport have been analyzed to compare the storage volume provided with the 100-year runoff volume. The projects, report dates and drainage basin areas evaluated are:

<u>Projects</u>	<u>Date</u>	Basins
Automobile Parking Lots	June 1998	A7 (a, b, c, d, e)
Resurfacing Taxiways and Apron	February 2000	A1, A2, A3, A4, E1, E2
Resurfacing Runway	January 2003	A5, A6, E3
Hangar Development, Taxilanes and Apron	December 2003	B1, Parking Lot

This report exclusively uses the information provided in these reports for the evaluation and comparison of the storage volume provided with the 100-year runoff volume. The summary of each project (Pages 2-5) includes the elevation at which runoff exits each basin, the storage volume provided, the 100-year runoff volume and the calculated difference between the storage provided minus the 100-year runoff volume. Excerpts of each page (from the above reports) providing data for this analysis is provided in Attachment A through Attachment D.

<u>Projects</u>	Attachment
Automobile Parking Lots	Attachment A
Resurfacing Taxiways and Apron	Attachment B
Resurfacing Runway	Attachment C
Hangar Development, Taxilanes and Apron	Attachment D

A summary table is also presented in page 6 for an overview of the difference between the total storage provided and the total 100-year rumoff volume.



Made by:	GP	Date:	5/5/2006
Checked by:		Time:	
Page:	2	or T	7

### KEY WEST INTERNATIONAL AIRPORT STORNWATER MANAGEMENT STORAGE VOLUME - 100 YR RUNOFF VOLUME ANALYSIS

### AUTOMOBILE PARKING LOTS

### BASIN A7 (a,b,c,d,e,)

Sub-Basin	[Pg. 18] Elev. At which Runoff Flows Offsite (Ft. NGVD)	[Pg. 18] Storage Volume Provided (Cu. Ft.)	[Pg. 20] 100-Yr Runoff Volume (Cu. Ft.)	Ofference (Storage Provided - 100-Yr Runoff Volume) (Cu. Ft.)
	3.82	11,353.01	70,821.07	-59,468.06
A-E	(Ft. NGVD)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)
	3.82	0.26	1.63	-1.37

**URS** 

Made by:	GP	Date:	5/5/200
Checked by:		Time:	
Page:	3	of	

### KEY WEST INTERNATIONAL AIRPORT STORMWATER MANAGEMENT STORAGE VOLUME - 100 YR RUNOFF VOLUME ANALYSIS

### RESURFACING TAXIWAYS AND APRON

### BASINS A1,A2,A3,A4,E1,E2

Basin	[Pg. 36] Min. Elev. At which Runoff Exits Basin (Ft. NGVD)	[Table 3] Storage Volume Provided (Ac. Ft.)	[Pg. 38] 100-Yr Runoff Volume (Ac. Ft.)	Difference (Storage Provided - 100-Yr Runoff Volume) (Ac. Ft.)
A1	2.25	0.0870	4.27	-4.18
A2	2.35	0.0674	3.18	-3.11
A3	2.30	0.2357	6.62	-6.38
A4	2.55	0.0141	2.04	-2.03
£1	2.90	1.0908	9.46	-8.37
E2	2.20	0.1909	5.47	-5.28
TOTAL		1.6859	31.04	-29.35

URS

Made by:	GP	Date:	5/5/2006
Checked by:		Time:	
Page:		of	7

# KEY WEST INTERNATIONAL AIRPORT STORWWATER MANAGEMENT STORAGE VOLUME - 100 YR RUNOFF VOLUME ANALYSIS

### RESURFACING RUNWAY

### BASINS A5,A6,E3

Basin	[Pg. 33] Min. Elev. At which Runoff Exits Basin (Ft. NGVD)	in. Elev. At Storage hich Runoff Volume exits Basin Provided		Difference (Storage Provided - 100-Yr Runoff Volume) (Ac. Ft.)
A5	2.9	2.66	12.84	-10.18
A6	2.9	4.15	17.84	-13.69
E3	2.9	2.78	9.61	-6.83
TOTAL		9.59	40.29	-30.70



Made by:	GP	Date:	5/5/200
Checked by:		Time:	
Page:	5	of.	7

### KEY WEST INTERNATIONAL AIRPORT STORMWATER MANAGEMENT STORAGE VOLUME - 100 YR RUNOFF VOLUME ANALYSIS

### HANGAR DEVELOPMENT TAXILANES AND APRONS

### BASINS B1 AND PARKING LOT

Basin	[Pg. 20] Min. Elev. At which Runoff Exits Basin (Ft. NGVD)	[Pg. 8] Storage Volume Provided * (Ac. Ft.)	[See SCS Method Calculation] 100-Yr Runoff Volume (Ac. Ft.)	Difference (Storage Provided - 100-Yr Runoff Volume) (Ac. Ft.)
B1/Parking Lot	3.5	2.07	5.28	-3.21

<sup>+</sup> Exempoisted

:

URS



# KEY WEST INTERNATIONAL AIRPORT STORMWATER MANAGEMENT STORAGE VOLUME - 100 YR RUNOFF VOLUME ANALYSIS

### TOTAL SUMMARY TABLE

Project	Beatns	Storage Volume Provided (Ac. Pt.)	100-Yr Runoff Volume (Ac. Ft.)	Difference (Storage Provided - 100-Yr Runoff Volume) (Ac. Pt.)	Percent Storage Provided for 100 Yr Runoff (%)
AUTOMOBILE PARKING LOTS	A7 (a,b,c,d,e)	0.26	1,63	-1.37	16.03
RESURFACING TAXIWAYS AND APRON	A1,A2,A3,A4,E1,E2	1.69	31.04	-29.35	5.43
RESURFACING RUNWAY	A5.A6.E3	9.59	40.29	-30.70	23.80
HANGAR DEVELOPMENT TAXILANES AND APRONS	B1 AND PARKING LOT	2.07	5.28	-3.21	39.23
TOTAL		13.61	78.23	-64.63	17.99

**ATTACHMENT A** 

### **MONROE COUNTY**

Key West International Airport
Automobile Parking Lots "A" & "B"
Project Number: C502520.63
System Proposed: Full on site retention with drainage wells

### **DRAINAGE CALCULATIONS**



### **BOARD OF COUNTY COMMISSIONERS**

MAYOR, Jack London Mayor Pro Tem, Wilhelmina Harvey Keith Douglass, Commissioner Shirley Freeman, Commissioner Mary Kay Reich, Commissioner

James L. Roberts County Administrator C. Dent Pierce Director of Public Works

June, 1998

Prepared By: URS Greiner, Inc. 5805 N.W. 11<sup>th</sup> Street, Suite 340 Miami, Florida 33126

### **TABLE OF CONTENTS**

NTRODUCTION	 ٠.	٠.	٠.	٠,٠	٠.	٠.		٠.	•	٠.	
DESIGN STORMS	 ٠.							٠.			٠.
100 YEAR FLOODPLAIN ENCROACHMENT .	 										
5 YEAR STORM	 										
AREAS AND CURVE NUMBERS											
PRE-TREATMENT VOLUME	 										
STAGE-STORAGE CALCULATIONS	 										
WEIR ELEVATION											
WEIL DISCHARGE	 										
BASIN SUMMARY											
ADICPR INPUT FILE											
NODAL MAXIMUM CONDITIONS											
STORM SEWER CALCULATIONS	 								-		
25 YEAR STORM											
100 YEAR STORM											
TOO TEAR STORIN	 • •		٠.	٠.	٠.	•	• •	٠.	•	• •	• •

# MAN.AS

SUBBASIN	REQUIRED RETENTION VOLUME (FI <sup>4</sup> )	PROVIDED <sup>(1)</sup> RETENTION VOLUME (Pt <sup>2</sup> )
A	5553.61	5510.40
В	1482.55	37.12
С	2212.78	461.39
D	1698.70	1547.22
E	0.00	3796.88
TOTALS:	10947.64	11363.01

(1) OBTAINED FROM STAGE - STORAGE CALCULATIONS FOR ELEVATION 3.82

= ELEVATION AT WHICH POINT RUNOFF BEGINS TO FLOW OFFSITE

Bosin AS

SUBBASINS	(CN=96) IMPERVIOUS DRAINAGE AREA (ACRES)	(CN=39) PERVIOUS DRAINAGE AREA (ACRES)	TOTAL DRAINAGE AREA (ACRES)	POST-DEV. WEIGHTED CURVE NUMBER
A-E	1.1890	0.3448	1.5338	83.19

SUBBASINS	S (INCHES)	Q TOTAL RUNOFF (INCHES) VOLUME (FIS)		CALCULATED MAXIMUM STAGE (1)	BUILDING FINISHED FLOOR ELEVATION		
A-E	2.02	12.72	70821.07	5.26	5.61		

(1) OBTAINED FROM STAGE - STORAGE CALCULATIONS

ATTACHMENT B

### KEY WEST INTERNATIONAL AIRPORT KEY WEST, FLORIDA

### **ENGINEER'S REPORT**

**FOR** 

# RESURFACING TAXIWAYS AND APRON



AIP No. 3-12-0037-1500
PFC Application No. 4
Item Nos. 25437518401
25438518401
FDOT WPI Project No. 6826783-6826784
URS Greiner Woodward Clyde Contract No. C500002520.65

Prepared by:

### URS Greiner Woodward Ciyde

Miami, Florida

FEBRUARY, 2000

### **TABLE OF CONTENTS**

		PAG	E				
1.	PROJECT LOCAT	TON	1				
2.	DESCRIPTION O	F WORK	1				
3.	CONDITION OF E	XISTING PAVEMENT	1				
4.	SUMMARY OF TE	ST DATA	2				
<b>5</b> .	PAVEMENT DESI	GN	3				
6.	DRAINAGE		4				
<b>7</b> .	AIRFIELD PAVEN	IENT MARKING	4				
8.	AIRFIELD LIGHTI	NG	4				
9.	SEQUENCE OF C	ONSTRUCTION	5				
10.	TIME OF COMPLETION						
11.	LIQUIDATED DAMAGES FOR DELAY 19						
12.	CONSTRUCTION	COST ESTIMATE 1	9				
13.	SAFETY AND SE	CURITY PROVISIONS 1	19				
14.	ENVIRONMENTA	L CONSIDERATIONS 2	<u>2</u> 0				
15.	MODIFICATION 1	O STANDARDS 2	20				
APP	ENDICES:						
	APPENDIX 'A'	CONSTRUCTION COST ESTIMATE					
	APPENDIX 'B'	GEOTECHNICAL INVESTIGATION REPORT					
	APPENDIX 'C'	PAVEMENT DESIGN CALCULATIONS					
	APPENDIX 'D'	DRAINAGE REPORT					

KEY WEST INTERNATIONAL AIRPORT - KEY WEST, FLORIDA FEBRUARY, 2000

APPENDIX "D"

DRAINAGE REPORT

PESUCPACHE LAXIMAYS 145 A POOLS

Key West International Airport

### TABLE OF CONTENTS

Ī	AGE
Introduction	1
Design Criteria.	2
Figure 5-1A (Existing Basin Boundaries)	3
Proposed Drainage Basin Map	
Table 1A: Pre-Development Drainage Basin Area Breakdown	5
Table 1B: Post-Development Drainage Basin Area Breakdown	6
Table 2A: Pre-Development Basin Curve Number Calculations	7
Table 2B: Post-Development Basin Curve Number Calculations	8
Table 3: Basin Stage-Storage Curves	9
Well Discharge Calculations	
Floodrouting Input File.	14
Basin Summary (5 year – 24 hour storm)	26
Node Maximum Conditions (5 year - 24 hour storm)	27
Water Quality Calculations	
Basin A1	28
Basin A2	29
Basin A3	30
Basin A4	31
Basin E1	32
Basin E2.	33
Node Time Series By Node (5 year - 24 hour storm)	34
Table 4: Water Quality Summary (5 year – 24 hour storm)	36
25 Year – 72 Hour Storm Summary	37
Table 5: 100 Year Maximum Stage Calculations	38

APPENDIX A: Design Aids

TABLE 4: WATER QUALITY SUMMARY (5 YEAR-24 HOUR STORM)

Pa 28-33

Basin	Minimum elevation at which runoff exits basin	Time at which this minimum elevation is reached	Basin Storage Volume at this minimum elevation(AF)	Basin well discharge volume at this minimum elevation (AF)	Total Basin Retention Volume (AF)	Required water quality retention volume (AF)
A1	2,25	11.722	0.0870	0.5442	0.6312	0.59
A2	2,35	11.764	0.0674	0.4333	0.5007	0.48
A3	2.30	11.742	0.2357	0.7625	0.9982	0.99
A4	2.55	11.797	0.0141	0.3186	0.3327	0.33
E1	2.90	12.418	1.0908	0.9087	1.9995	1.41
E2	2.20	11.850	0.1909	0.6464	0.8373	0.75

TABLE 3: BASIN STAGE - STORAGE CURVES

Storage		T	I				
Volume (AF)	Elevation	Basin A1	Basin A2	Basin A3	Basin A4	Basin E1	Basin E2
1.1 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.2 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.3 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.			Volume	Volume	Volume	Volume	Volume
1.2 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.3 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.5 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.	1.0	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
1.3	1.1	0.0000	0.0000	0.0000	0.0000	0.0000	9.0000
1.4 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.5 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.6 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.0	1.2	0.0000	0.0000	0.0000	0.0000	0.0000	9,0000
1.5 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.6 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.7 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.0000 0.00	1.3	0,000	0.0000	0,0000	0.0000	0.0000	0.0000
1.6         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.0000         0.00114         1.9         0.0000         0.0001         0.0001         0.0000         0.0014         0.0000         0.0000         0.0015         0.0000         0.0075         0.0004         0.0000         0.0757         0.122         0.0015         0.0007         0.1262         0.0015         0.0007         0.1262         0.0015         0.0007         0.1262         0.0015         0.0007         0.1262         0.0015         0.0007         0.1262         0.0015         0.0007         0.1262         0.0015         0.0007         0.1262         0.0015         0.0007         0.1262         0.0014         0.0007         0.1262         0.0004         0.0007         0.1262         0.0004         0.0007         0.0004         0.0007         0.0004         0.0007         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004         0.0004	1.4	0.0000	0.000	0.0000	0.0000	0.0000	0.0000
1.7         0.0000         0.0000         0.0028         0.0000         0.0000         0.0000           1.8         0.0000         0.0000         0.0132         0.0000         0.0000         0.0114           1.9         0.0000         0.0001         0.0244         0.0001         0.0000         0.0385           2.0         0.0001         0.0016         0.0576         0.0004         0.0000         0.0757           2.1         0.0057         0.0073         0.1029         0.0015         0.0027         0.1282           2.2         0.0426         0.0168         0.1587         0.0001         0.0224         0.1309           2.3         0.1313         0.0413         0.2357         0.0052         0.0654         0.2717           2.4         0.3611         0.0994         0.3119         0.0078         0.1454         0.3799           2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5822         0.0167         0.4012         0.6724           2.7         0.9369         0.4700         0.7555         0.0252         0.5611         0.788	1.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.8         0.0000         0.0000         0.0132         0.0000         0.0011           1.9         0.0000         0.0001         0.0284         0.0001         0.0000         0.0385           2.0         0.0001         0.0016         0.0576         0.0004         0.0000         0.0757           2.1         0.0057         0.0073         0.1029         0.0015         0.0027         0.1282           2.2         0.0466         0.0164         0.1587         0.0001         0.0224         0.1202           2.3         0.1313         0.0413         0.2357         0.0052         0.0654         0.2717           2.4         0.3681         0.0994         0.3319         0.0078         0.1454         0.3709           2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5872         0.0167         0.4012         0.6324           2.7         0.9369         0.4700         0.7555         0.0252         0.5861         0.7988           2.8         1.2390         0.6677         0.9334         0.0363         0.8125         0.9921           2.9         1.	1.6	0,0000	0.0000	0.0006	0.0000	0.0000	0.0000
1.9	1.7	0,0000	6,0000	0.0028	0.0000	0.0000	0.0000
2.0         0.0001         0.0016         0.0576         0.0004         0.0000         0.0757           2.1         0.0057         0.0073         0.1029         0.0015         0.0027         0.1262           2.2         0.0446         0.0164         0.1547         0.0001         0.0224         0.1309           2.3         0.1313         0.0413         0.2357         0.0052         0.0654         0.2717           2.4         0.3611         0.0994         0.3319         0.0078         0.1454         0.3709           2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5852         0.0167         0.4012         0.6324           2.7         0.9369         0.4700         0.7555         0.0252         0.5861         0.7988           2.8         1.2390         0.6677         0.9334         0.0363         0.8125         0.9921           2.9         1.5634         0.8906         1.1448         0.0503         (.1.1090         1.4519           3.0         1.9009         1.4290         1.4519         0.0694         1.8174         1.7431           <	1.8	0.0000	0.0000	0.0132	0.0000	0.0000	0.0114
2.1         0.0057         0.0073         0.1029         0.0015         0.0027         0.1282           2.2         0.0426         0.0168         0.1587         0.0001         0.0224         (0.1909)           2.3         0.1313         0.0413         0.2257         0.0052         0.0654         0.2717           2.4         0.3611         0.0994         0.3119         0.0078         0.1454         0.3799           2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5872         0.0167         0.4012         0.6324           2.7         0.9369         0.4700         0.7555         0.0252         0.5861         0.7988           2.8         1.2390         0.6677         0.9334         0.0363         0.8125         0.9921           2.9         1.5634         0.8906         1.1448         0.0503         (.1.0908         1.2134           3.0         1.9009         1.4519         0.0694         1.4561         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2	1.9	0.0000	0.0001	0.0284	0.0001	0.0000	0.0385
22         0.0466         0.0168         0.1587         0.0001         0.0224         . 0.1509           23         0.1313         0.0413         0.2357         0.0052         0.0654         0.2717           24         0.3681         0.0994         0.3119         0.0078         0.1454         0.3799           2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5872         0.0167         0.4012         0.6324           2.7         0.9369         0.4700         0.7555         0.0252         0.5861         0.7988           2.8         1.2390         0.6677         0.9334         0.0363         0.8125         0.9921           2.9         1.5634         0.8906         1.1448         0.0503         (.1.10908         1.2134           3.0         1.9009         1.1290         1.4519         0.0694         1.4561         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2         2.533         1.8735         2.5069         0.2057         2.7226         2.3602	2.0	1000.0	0,0016	0.0576	0.0004	0.0000	0,0757
23         0.1313         0.0413         0.2357         0.0052         0.0654         0.2717           24         0.3611         0.0994         0.3119         0.0078         0.1454         0.3709           2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5872         0.0167         0.4012         0.6324           2.7         0.9369         0.4700         0.7555         0.0252         0.5861         0.7988           2.8         1.2390         0.6577         0.9334         0.0363         0.8125         0.9921           2.9         1.5634         0.8906         1.1448         0.0503         (.1.0908         1.2134           3.0         1.9009         1.1290         1.4519         0.0694         1.4561         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2         2.5334         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5669         0.2057         2.7226         2.3692           <	2.1	0.0057	0.0073	0.1029	0.0015	0.0027	0.1262
2.4         0.3681         0.0934         0.3319         0.0078         0.1454         0.3709           2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5872         0.0167         0.4012         0.6324           2.7         0.9369         0.4700         0.7555         0.0252         0.5861         0.7988           2.8         1.2390         0.6577         0.9334         0.0363         0.8125         0.9921           2.9         1.5634         0.8906         1.1448         0.0503         (1-1,0908         1.2134           3.0         1.9009         1.1290         1.4519         0.0694         1.4561         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2         2.5334         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5669         0.2057         2.7226         2.3692           3.4         3.2676         2.1234         2.9219         0.2813         3.2170         2.7347	2.2	0,0426	0.0168	0.1587	0.0031	0.0224	(0.1909)
2.5         0.4467         0.1807         0.4498         0.0115         0.2534         0.4805           2.6         0.6696         0.3073         0.5872         0.0167         0.4012         0.6724           2.7         0.9369         0.4700         0.7555         0.0252         0.5861         0.7988           2.8         1.2390         0.6677         0.9334         0.0863         0.8125         0.9921           2.9         1.5634         0.8906         1.1148         0.0503         (1.10908         1.2134           3.0         1.9009         1.1290         1.4519         0.0694         1.4561         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2         2.3334         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5069         0.2057         2.7226         2.3892           3.4         3.2676         2.1234         2.9219         0.2813         3.2170         2.7347           3.5         3.4698         2.3772         3.3615         0.3694         3.7323         3.0881	2.3	0.1313	0.0413	0.2357	0.0052	0,0654	0.2717
2.6         0.6666         0.3073         0.5872         0.0167         0.4012         0.6324           2.7         0.9369         0.4700         0.7555         0.0252         0.5661         0.7988           2.8         1.2390         0.6677         0.9334         0.0863         0.8125         0.9921           2.9         1.5634         0.8506         1.1148         0.0503         (-1.0008         1.2134           3.0         1.5009         1.1280         1.4519         0.0694         1.4561         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2         2.5834         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5669         0.2057         2.7226         2.3902           3.4         3.2676         2.1234         2.9219         0.2813         3.2170         2.7347           3.5         3.4698         2.3772         3.3615         0.3694         3.7323         3.0881           3.6         3.9518         2.6221         3.8254         0.4722         4.2671         3.4694	2.4	0.2681	0.0934	0.3319	0.0078	0.1454	0.3709
27         0.9369         0.4700         0.7555         0.0252         0.3861         0.7988           2.8         1.2390         0.6677         0.9534         0.0863         0.8125         0.9921           2.9         1.5634         0.8066         1.1148         0.0503         (< -1.0908	2.5	0.4467	0.1807	0.4498	0.0115	0.2524	0.4905
2.8         1.2390         0.6577         0.9334         0.0863         0.8125         0.9921           2.9         1.5634         0.8906         1.1148         0.0503         (-1.0908)         1.2134           3.0         1.9009         1.1290         1.4519         0.0694         1.4561         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2         2.5334         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5069         0.2057         2.7226         2.3902           3.4         3.2676         2.1234         2.9219         0.2813         3.2170         2.7347           3.5         3.4608         2.3772         3.3615         0.3694         3.7323         3.0881           3.6         3.9518         2.6221         3.8254         0.4722         4.2671         3.4694           3.7         4.2934         2.8779         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7985         0.7085         5.3996         4.1919	2.6	0.6696	0.3073	0.5882	0.0167	0.4012	0.6324
2.9         1.5634         0.8906         1.1148         0.0503         (-1.0008)         1.2134           3.0         1.9009         1.1290         1.4519         0.0694         1.4261         1.4631           3.1         2.2418         1.3746         - 1.7640         0.0978         1.8174         1.7431           3.2         2.5834         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5069         0.2057         2.7226         2.3902           3.4         3.2676         2.1234         2.9219         0.2813         3.2170         2.7347           3.5         3.4098         2.3772         3.3615         0.3694         3.7323         3.0881           3.6         3.9518         2.6221         3.8254         0.4722         4.2671         3.4694           3.7         4.2934         2.8729         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7965         0.7085         5.3996         4.1919           3.9         4.9779         3.3726         5.2994         0.8271         5.9839         4.5720	2.7	0.9369	0.4700	0.7555	0.0252	0.5861	0.7988
3.0         1,5009         1,1200         1,4519         0,0564         1,451         1,4631           3.1         2,2414         1,3746         - 1,7640         0,0978         1,8174         1,7431           3.2         2,5334         1,6237         2,1188         0,1623         2,2576         2,0560           3.3         2,9258         1,8735         2,5669         0,2057         2,7226         2,3902           3.4         3,2676         2,1224         2,9219         0,2613         3,2170         2,7347           3.5         3,6698         2,3732         3,3615         0,3694         3,7323         3,0811           3.6         3,9518         2,6221         3,8254         0,4722         4,2671         3,4694           3.7         4,2934         2,8729         4,3061         0,5864         4,8211         3,8175           3.8         4,6359         3,1224         4,7945         0,7045         5,3936         4,1919           3.9         4,9779         3,3726         5,2994         0,8371         5,9839         4,5720           4.0         5,3199         3,6225         5,8663         0,9680         6,5910         4,9574 <t< td=""><td>2.8</td><td>1.2390</td><td>0.6677</td><td>0.9534</td><td>0.0363</td><td>0.8125</td><td>0.9921</td></t<>	2.8	1.2390	0.6677	0.9534	0.0363	0.8125	0.9921
3.1         2.2418         1.3746         - 1.7640         0.0678         1.8174         1.7431           3.2         2.5838         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5669         0.2057         2.7226         2.3002           3.4         3.2676         2.1234         2.9219         0.2813         3.2170         2.7347           3.5         3.6098         2.3732         3.3615         0.3694         3.7323         3.0881           3.6         3.9518         2.6221         3.8254         0.4722         4.2671         3.4694           3.7         4.2938         2.8729         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7985         0.7085         5.3996         4.1919           3.9         4.9779         3.3726         5.2994         0.8371         5.9839         4.5720           4.0         5.3199         3.6225         5.8663         0.9680         6.5910         4.9574           4.1         5.6619         3.8723         6.3183         1.1006         7.2142         5.3472	2.9	1.5638	0,8906	1.1848	0,0503	(-1.0908	1.2134
3.2         2.5134         1.6237         2.1188         0.1423         2.2526         2.0560           3.3         2.9258         1.8735         2.5669         0.2057         2.7226         2.3002           3.4         3.2676         2.1234         2.9219         0.2813         3.2170         2.7347           3.5         3.6098         2.3732         3.3615         0.3694         3.7323         3.0881           3.6         3.9518         2.6221         3.8254         0.4722         4.2671         3.4694           3.7         4.2934         2.8729         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7985         0.7085         5.3996         4.1919           3.9         4.9779         3.3726         5.2994         0.8371         5.9839         4.5720           4.0         5.3199         3.6225         5.8063         0.9680         6.5910         4.9574           4.1         5.6619         3.8723         6.3183         1.1006         7.2142         5.3472	3.0	1.9009	1.1290	1.4519	0.0694	1.4261	1.4631
3.3         2.9258         1.8735         2.5669         0.2057         2.7226         2.3002           3.4         3.2676         2.1224         2.9219         0.2813         3.2170         2.7347           3.5         3.6098         2.3732         3.3615         0.3694         3.7323         3.0881           3.6         3.9518         2.6221         3.8254         0.4722         4.2671         3.4694           3.7         4.2938         2.8729         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7985         0.7085         5.3996         4.1919           3.9         4.9779         3.3726         5.2994         0.8371         5.9839         4.5720           4.0         5.3199         3.6225         5.8063         0.9680         6.5910         4.9574           4.1         5.6619         3.8723         6.3183         1.1006         7.2142         5.3472	3.1	2.2418	1.3746	- 1.7640	0.0978	1,8174	1.7431
3.4         3.2676         2.1224         2.9219         0.2813         3.2170         2.7347           3.5         3.6698         2.3732         3.3615         0.3694         3.7323         3.0811           3.6         3.9518         2.6221         3.8254         0.4722         4.2671         3.4694           3.7         4.2934         2.8729         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7945         0.7085         5.3936         4.1919           3.9         4.9779         3.3726         5.2994         0.8371         5.9839         4.5720           4.0         5.3199         3.6225         5.8663         0.9680         6.5910         4.9574           4.1         5.6619         3.8723         6.3183         1.1006         7.2142         5.3472	3.2	2.5838	1.6237	2.1188	0.1423	2,2526	2.0560
3.5         3.6098         2.3732         3.3615         0.3694         3.7323         3.0811           3.6         3.9518         2.6231         3.8254         0.4722         4.2671         3.4694           3.7         4.2934         2.8729         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7945         0.7045         5.3936         4.1919           3.9         4.9779         3.3726         5.2994         0.8371         5.9839         4.5720           4.0         5.3199         3.6225         5.8663         0.9680         6.5910         4.9574           4.1         5.6619         3.8723         6.3183         1.1006         7.2142         5.3472	3.3	2.9258	1.8735	2.5069	0.2057	2.7226	2.3902
3.6         3.9518         2.6231         3.8254         0.4722         4.2671         3.4694           3.7         4.2934         2.8729         4.3061         0.5864         4.8211         3.8175           3.8         4.6359         3.1224         4.7945         0.7045         5.3936         4.1919           3.9         4.9779         3.3726         5.2994         0.8371         5.9839         4.5720           4.0         5.3199         3.6225         5.8663         0.9680         6.5910         4.9574           4.1         5.6619         3.8723         6.3183         1.1006         7.2142         5.3472	3.4	3,2676	2.1234	2.9219	0.2813	3.2170	2.7347
3.7 4.2934 2.8729 4.3661 0.5864 4.8211 3.8175 3.8 4.6359 3.1224 4.7985 0.7085 5.3936 4.1919 3.9 4.9779 3.3736 5.2994 0.8271 5.9839 4.5720 4.0 5.3199 3.6225 5.8663 0.9680 6.5910 4.9574 4.1 5.6619 3.8723 6.3183 1.1006 7.2142 5.3472	3.5	3.609\$	2.3732	3.3615	0.3694	3.7323	3.0611
3.1     4.63.59     3.1221     4.7945     0.7045     5.3936     4.1919       3.9     4.9779     3.3726     5.2994     0.8771     5.9839     4.5720       4.0     5.3159     3.6225     5.8663     0.9680     6.5910     4.9574       4.1     5.6619     3.8723     6.3183     1.1006     7.2142     5.3472	3.6	3.9518	2.6231	3.8254	0,4722	4,2671	3,4494
3.9 4.9779 3.3726 5.2994 0.8371 5.9809 4.5720 4.0 5.3199 3.6225 5.8063 0.9680 6.5910 4.9574 4.1 5.6619 3.8723 6.3183 1.1006 7.2142 5.3472	3.7	4.2938	2,8729	4.3061	0.5864	4.8211	3,8175
4.0 5.3199 3.6225 5.8063 0.9680 6.5910 4.9574 4.1 5.6619 3.8723 6.3183 1.1006 7.2142 5.3472	3.8	4.6359	3.1228	4.7985	0.7085	5.3936	4.1919
4.1 5.6619 3.8723 6.3183 1.1006 7.2142 5.3472	3.9	4,9779	3.3726	5.2994	0.8371	5.9839	4.5720
3002 3502 0.100 1.1000	4.0	5.3199	3.6225	5.8063	0.9680	6.5910	4.9574
	4.1	5.6619	3.8723	6.3183	1.1006	7.2142	5.3472
	4.2	6,0039	4.1222	6.8347	1.2348	7.8527	5.7416

ANDERDRESS/CS0006-P000104PD

TABLE 3: (CONTINUED)

Elevation	Basin A1	Basin A2	Basin A3	Basin A4	Basin E1	Basin E2
	Storage Volume (AF)	Storage Volume (AF)	Storage Volume (AF)	Storage Volume (AF)	Storage Volume (AF)	Storage Volume (AF)
43	6.3459	43720	7.3549	1.3704	E.5066	6.1404
44	6.6880	4.6219	7,8783	1.5073	9.1753	6.5433
4.5	, 7.0300	4.8717	8.4045	1.6455	9.8500	6,9499
4.6	7.3720	5.1216	8.9332	1.7850	10.5545	7.3600
47	7.7140	53714	9.4641	1.9260	11.2646	7.7732
, 48	8.0560	5.6213	9.9966	2.0685	11.9001	8.1893
49	8.3960	5.8711	10.5305	2.2123	12.7248	8.6076
5.0	8.7401	6.1209	11.0653	2.3578	13,4772	9.0276
5.1	9.0621	6.3708	11.6001	2.5036	14.2392	9.4493
5.2	9,4241	6.6206	12.1350	2.6495	15.0027	9.8738

TABLE 5: 100 YEAR MAXIMUM STAGE CALCULATIONS

Basin	Weighted Soil Storage	Basin Runoff Volume	Total Basin Area	Total Basin Runoff Volume	Maximum Stage (see flood routing stage-storage)
Al	0.07*	(14.82*	3.46 AC	4.27 AC-Ft.	3.69
A2	0.04"	14.85*	2.57 AC	3.18 AC-Ft.	3.82
A3	0.04"	14.85*	5.35 AC	6.62 AC-Ft.	4.16
A4	0.00"	14.90"	1.64 AC	2.04 AC-Ft.	4.78
El	0.05*	14.84"	7.65 AC	9.46 AC-Ft.	4.44
E2	0.04"	14.85"	4.42 AC	5.47 AC-Ft.	4.13

### Sample Calculation:

BASIN A1: Basin Runoff Volume

 $= (P-0.25)^{2}$  (P+0.85)

 $= [\underline{14.940.2(0.07)}^2 \\ 14.940.8 (0.07)$ 

= 14.82"

Total Basin Runoff Volume

= (14.82in) (3.46 ac) (1 ft./12 in)

= 4.27 AC-Ft.

ATTACHMENT C

# EXECUTED COPY

### **CONTRACT DOCUMENTS**

### RESURFACING RUNWAY 9-27 AND DRAINAGE KEY WEST INTERNATIONAL AIRPORT MONROE COUNTY, FLORIDA



Items Nos. 25437519401
A.I.P. No. 3-12-0037-2103
PFC Application No. 4 and No. 7
URS Corporation Contract No.: 12637814

### Prepared for:

# THE MONROE COUNTY BOARD OF COUNTY COMMISSIONERS

MS. DIXIE M. SPEHAR, DISTRICT 1
MR. MURRAY E. NELSON, DISTRICT 5
MR. GEORGE NEUGENT, DISTRICT 2
MR. CHARLES "SONNY" McCOY, DISTRICT 3
DR. DAVID P. RICE, DISTRICT 4

MAYOR MAYOR PROTEM COMMISSIONER COMMISSIONER COMMISSIONER

Prepared by:

**URS CORPORATION** 

**JANUARY 2003** 

RESORPACIAG RUNWAT

APPENDIX "D"

DRAINAGE REPORT

January 2003

# TABLE OF CONTENTS

	PAGE
Introduction	1
Design Criteria	2
Figure 1: Existing Basin Boundaries	
Figure 2: Proposed Drainage Basin Map	4
Table 1A: Pre-Development Drainage Basin Area Breakdown	
Table 1B: Post-Development Drainage Basin Area Breakdown	
Table 2A: Pre-Development Basin Curve Numbers Calculations	
Table 2B: Post-Development Basin Curve Numbers Calculations	
Table 3: Post-Development Stage-Storage Curves	
Well Discharge Calculations	
Floodroutin Input File	10
Basin Summary (5 year-24 hour storm)	
Node Maximum Conditions (5 year - 24 hour storm, Pre and Post Development)	
Nodes Time series by Node (5 year – 24 hour storm)	
Water Quality Calculations	30
Basin A5	30
Basin A6	31
Basin E3	. 32
Table 4: Water Quality Summary (5year-24 hour storm)	33
25 Year – 72 hour Storm Summary	
100 year maximum stage Summary	

APPENDIX A: Design Aids

### WATER QUALITY SUMMARY (5 YEAR - 24 HOUR STORM)

Basin	Minimum Elevation at wich ruoff exits basin	Basin Storage Volume at this minimun Elevation(AF)	Required Water Quality Retention Volume (AF)
A5	2.9	2,66	1.43
A6	2.9	4.15	1.86
E3	2.9	2.78	1.08

### Note:

In all the proposed basins the Water Quality that will be provided is more than the required Water Quality calculated following the criteria set for Key West.

### 100 MAXIMUM STAGE CALCULATIONS

Basin	Weighted Soil	Basin Runoff	Total Basin	Total Basin
	Storage	Volume	Area(AC)	Runoff Volume (AF)
A5	0.4	14.43"	10.68	12.84
A6	0.42	14.40"	14.87	17.84
E3	0.26	14.59"	7.9	9.61

### Sample Calculation:

Basin A1:

Basin Runoff Volume:

 $=\frac{(P-0.2S)^2}{(P+0.8S)}$ 

 $= \underbrace{[14.9 - 0.2(0.4)]^2}_{(14.9 + 0.8(0.4)}$ 

= 14.43"

Total Basin Runoff Volume:

= (14.43 in) (10.68 ac) (1 ft/12 in)

= 12.84 AC\_FT

# ATTACHMENT D

### KEY WEST INTERNATIONAL AIRPORT KEY WEST, FLORIDA

### DRAINAGE REPORT FOR HANGAR DEVELOPMENT, TAXILANES AND APRON



URS Contract No. 12637972

Prepared By:

# URS

URS Corporation
7650 Corporate Center Drive
Suite 400
Miami , FL 33126
Tel: 305.262.7466
PE LIC. # EB 00000002

JUAN C. GARCIA P.E. #46597

DECEMBER, 2003

# TABLE OF CONTENTS

<u>PAG</u>	E
Introduction	
Design Criteria	
Figure 1: Existing Drainage Conditions	
Figure 2: Proposed Drainage Basin Map 4	
Table 1A and 1B: Pre and Post-Development Drainage Basin Area Breakdown 5	
Table 2A and 2B: Pre and Post Development Basin Curve Numbers Calculations 6	
Well Discharge Calculations7	
Basin B-1 Floodrouting Input File 8	
Basin B-1 and Parking Lot Summary	l
Basin B-1 Node Maximum Conditions	4
Water Quality Calculations	
Basin B-1 15	5
Basin Parking Lot 16	
Basin B-1 Storm Drain Tabulation form	7
Basin Parking Lot Storm Drain Tabulation form	ţ
Water Quality Summary 19	)
25 year - 72 hour Storm Summary 20	)
ADDENDIY A. Daciera Aide	

APPENDIX A: Design Aids APPENDIX B: CDS Hydraulic and Water Quality Calculations

.

### 25 YEAR -72 HOUR STORM SUMMARY:

By comparing the pre-development runoff curve numbers for both basins (B-1 and Parking Lot) with the post-development runoff curve numbers, it is seen that the runoff curve numbers are the same. As a result, the total basin runoff under pre-development conditions is the same as the total basin runoff under pre-development conditions.

The Node Maximum Condition results for Basin B-1 shows a maximum stage of 2.84; this demonstrates during a 25 year - 72 hours storm there will not be any offsite discharge (since the elevation at which runoff is discharges offsite is 3.50.

### TABLE 2A: PRE-DEVELOPMENT AND POST-DEVELOPMENT BASIN CURVE NUMBER CALCULATIONS (BASIN: B-1)

1	Conditions	Percent	Average Pervious	Design Water	Average Distance to	Developed Available	Weighted	Basin Curve
١		Pervious Area	Area Ground Elevation	Table Elevation	Water Table	Soil Storage	Soli Storage	Number
I	Existing Conditions	40%	2.5	1.5	1.00	0.6"	0.24	98
	Proposed Conditions	21%	2.7	1.5	1.20	0.98"	0.21	98

### TABLE 2B: PRE-DEVELOPMENT AND POST-DEVELOPMENT BASIN CURVE NUMBER CALCULATIONS (BASIN: PARKING LOT)

Conditions	Percent Pervious Area	Average Pervious Area Ground Elevation	Design Water Table Elevation	Average Distance to Water Table	Developed Available Soli Storage	Weighted Soil Storage	Basin Curve Number
Existing Conditions	19%	2.8	1.5	1.30	1.17"	0.22	98
Proposed Conditions	9%	3.1	1.5	1.60	1.74"	0.16	98

CN = 1000 0.24+10

CN = 97.65

CN = 98

**URS** 

Made by:	GP	Date:	5/5/2006
Checked by:		Time:	

### **KEY WEST INTERNATIONAL AIRPORT** STORMWATER MANAGEMENT STORAGE VOLUME - 100 YR RUNOFF VOLUME ANALYSIS

### SCS METHOD - HANGAR DEVELOPMENT TAXILANES AND APRONS

CN = [Pg. 6]

S = Potential Maximum Retention

S = 1000 / CN - 10

P = Precipitation

Q = Accumulated Runoff

 $Q = (P - 0.2 S)^2$ P+0.8S

14,66 Inches

V = Runoff Volume

 $V = Q \times A$ 

V = 14.66 Inches \* 4.32 Acres

RUNOFF VOLUME = 229,859 Cubic Feet

RUNOFF VOLUME = 5.28 Acre-Feet

```
Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.21)
```

KEY WEST INTERNATIONAL AIRPORT HANGAR DEVELOPMENT, TAXILANES AND APRON

```
Name: N-1
             Base Flow(cfs): 0
                                    Init Stage(ft): 2
 Group: BASE
                                    Warn Stage(ft): 3.5
Comment: Stage VS volume for Basin B-1
Stage(ft)
          Volume(af)
                       Bottom Area(ac): 0
          0.0001
2.1
          0.002
          0.012
2.2
2.3
          0.032
          0.039
2.5
          0.094
2.6
2.7
          0.174
          0.289
          0.442
2.9
          0.623
0.821
3.1
          1.036
          1.274
3.3 1.54 -----Class: Node------
  Name: N-OUTFLL Base Flow(cfs): 0 Init Stage(ft): 1.5
 Group: BASE
                                    Warn Stage (ft): 99
Comment:
Time(hrs) Stage(ft)
0 1.5
100 1.5
100
------Class: Operating Table-----
Name: WELL Type: Rating Curve
Comment: Well capacity in Basin B-1
  U/S Stage(ft)
                Discharge(cfs)
  1.5
                3.14
                3.77
  2.3
                5.02
5.65
                6.28
                6.91
  2.7
                7.53
8.16
  2.8
                8.79
  3
3.1
                9.421
                10.05
  3.2
                10.68
```